

## **REMARKS**

The Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

### **I. Status of the Claims**

Claims 4 and 6 are amended to clarify that the claimed fiber reinforced plastic comprises a **cured** thermoset shape memory polymer; certain parts of the claims are also amended to reflect the clarification. Support for the amendments can be found in, for example, paragraph [0047] of the Specification. Claims 21-24 are cancelled. The Applicants reserve the right to pursue the subject matter of the cancelled claims in a subsequent continued application. No new matter has been introduced, and claims 4-12 and 16-18 are currently pending to be examined on their merits.

### **II. Claim Objections & 35 U.S.C. § 112 Claim Rejections**

With the cancellation of claims 21-24, the Applicants respectfully submit that the objections and rejections based on 35 U.S.C. § 112 are now moot, and thus request reconsideration.

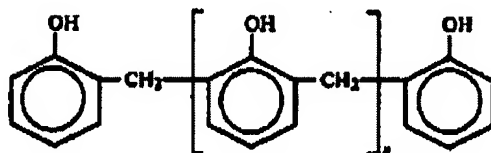
### **III. Claim Rejections – 35 U.S.C. §§ 102, 103**

Claims 4-9, 10-12, and 16-24 are rejected under 35 U.S.C. § 102(b) as allegedly anticipated by or, alternatively, under 35 U.S.C. § 103(a) as allegedly obvious over Heine (US 4,403,064), as exemplified by Hans (US 3,350,438). The Applicants respectfully traverse the rejections.

Anticipation Rejection

Heine does not anticipate the present claims. Without acquiescing to the grounds of rejections, claims 4 and 6 are amended to recite that the claimed fiber reinforced plastic comprises a **cured thermoset shape memory polymer** having a particular composition.

Firstly, Heine discloses a fiber reinforced polyurethane material, but nowhere does Heine disclose this polyurethane being a shape-memory polymer. **Not all polyurethanes are shape-memory polymers.** As described in the present Specification, a shape-memory polymer is a particular type of polymer that has hard and soft segments – in the case of the present application, the hard segment is an isocyanate component and the soft segment a polyol component. For example, the soft segment of the polyol has a formula OH-R-OH, in which R is a group having **no benzene ring or one or two** benzene rings (*see e.g.*, col 3, lines 15-24, US 5,145,935, which was submitted to the Office in an Information Disclosure Statement on October 12, 2006). By contrast, the polyurethane of Heine requires a novolak shown in the following formula:



in which n is an integer of from 1 to 11, as a polyol component (*see e.g.*, col 3, lines 8-49; col 4, lines 6-16, Heine). Thus, the polyol component of Heine contains at least three benzene rings, and the polyurethane of Heine does not contain a shape memory polymer. Therefore, Heine cannot anticipate the present claims.

Furthermore, the Applicants respectfully submit that the Office has incorrectly analogized Heine's teaching to the claimed method. The Office directs to col 7, lines 45-68; col 8, lines 1-5 of Heine and asserts that a polyurethane of Heine has a shape memory property because a cured product of a fibrous material impregnated with the polyurethane composition can be reheated, thereby allowing the cured product to be reshaped (Page 3, Office Action). The Applicants respectfully traverse. Heine describes that a preliminary reaction of the impregnated material is

carried out to form a prepreg, but does not at all describe curing the impregnated material (col 7, line 45 to col 8 line 5). A prepreg is a sheet of fiber cloth which has been preimpregnated with a B-stage resin, and a B-stage resin is a resin that has been partially cured but remains a thermoplastic (col 1, lines 48-49, Heine). Thus, not only does Heine not teach that the resin is “cured,” as recited in the present claims, but also it teaches away from the present claims by disclosing that the resin is a “thermoplastic.”

The Applicants further assert that because of, but not limited to, the foregoing reasons, the present claims cannot be deemed as inherent from Heine’s teaching (pages 4-5, Office Action). Because Heine does not teach every element as recited in the present claims, it cannot anticipate the present claims. The Applicants respectfully request that the rejection be withdrawn.

Obviousness Rejection

For the reasons similar to those described previously, the present claims also cannot be obvious over Heine, or Heine as exemplified by Hans. Nowhere does Heine or Hans teach or suggest that a fiber reinforced plastic comprises a cured thermoset shape memory polymer with the recited composition. Moreover, as described in the previous section, Heine teaches away from the present claims by disclosing that the resin of Heine is a thermoplastic, rather than a cured thermoset, as recited in the claims. Therefore, Heine or Heine as exemplified by Hans cannot render the present claims obvious. Thus, the Applicants respectfully request that the rejection be withdrawn.

### CONCLUSION

The Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, the Applicants hereby petition for such extension under 37 C.F.R. § 1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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By 

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